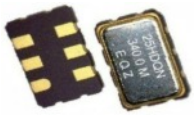
QN Series CMOS Oscillators

'HTQN' Specification Low Jitter Oscillators 50MHz to 250MHz

FEATURES

- **Low jitter <0.6ps phase jitter**
- **Wide frequency Range 50.0MHz to 250.0MHz**
- **Low supply current <30mA at 50MHz**
- **Supply voltage range 2.5V or 3.3V**
- **Tristate function to conserve power**



('536' package displayed)

DESCRIPTION

'HTQN' series oscillators have been developed as a precision frequency control component, providing a CMOS output clock oscillator with low current consumption, wide operating frequency range and an integrated phase jitter performance of 0.6ps r.m.s. The part is available in two industry-standard packages, 7 x 5mm SMD and 5 x 3.2mm SMD.

GENERAL SPECIFICATION

Output Logic Type:	LVCMOS / LVTTL
Frequency Range:	50.0MHz to 250.0MHz
Load:	15pF
Power Supply Voltage:	2.5±5%VDC or +3.3±10%VDC
Output Voltage 'HIGH':	0.9*V_{DD} minimum
Output Voltage 'LOW':	0.1*V_{DD} maximum
Frequency Stability:	See Frequency Stability Table*
Duty Cycle:	50±5%
Rise Time:	1.5 nsec typical**
Fall Time:	3.0 nsec maximum**
Current Consumption	
50-100MHz:	30mA
101-150MHz:	38mA
151-200MHz:	43mA
201-250MHz:	48mA
Current with output disabled:	16mA typical
Start-up Time:	10ms maximum
Ageing:	±5ppm max., first year
OE Control on Pad 1	
Enable:	0.7% V_{DD} min., or no connection
Disable:	0.3%V_{DD} max., (high impedance).
Output Enable Time:	200ns max.
Output Disable Time:	50ns max.
Phase Jitter r.m.s.:	0.6ps typical (12kHz to 20MHz)

PART NUMBERING

Example: 25HTQN536E-100.00

Supply Voltage
25 = 2.5 Volts
3 = 3.3 Volts

Series/Model
'HTQN' = QN series, HCMOS output

Package
536 = 5.0mm x 3.2mm
576 = 7.0mm x 5.0mm

Temperature Stability
'E' = ±50ppm over -40° to +85°C

Frequency in MHz

Stability ±ppm	Temperature Range °C	Order Code
25	-10 to +70	A
50	-10 to +70	B
100	-10 to +70	C
25	-40 to +85	D
50	-40 to +85	E
100	-40 to +85	F

Notes:

* *Note that Frequency stability quoted is inclusive of all conditions, Calibration Tolerance at 25°C, stability over operating temperature range, 1st year ageing at 25°C, supply voltage & output load changes and shock & vibration.*

** *Rise/Fall times are measure between 10% to 90%V_{DD}*

HPQN SERIES PHASE NOISE & PHASE JITTER DATA

	Frequency (MHz)	156.25	622.08
SSB Phase Noise Data (dBc/Hz typical)	10Hz offset	-55	-48
	100Hz offset	-85	-85
	1kHz offset	-109	-101
	10kHz offset	-116	-102
	100kHz offset	-118	-103
	1MHz offset	-139	-124
	10MHz offset	-146	-133
Phase Jitter (ps) (12kHz ~ 20MHz. r.m.s.)		0.6	0.6

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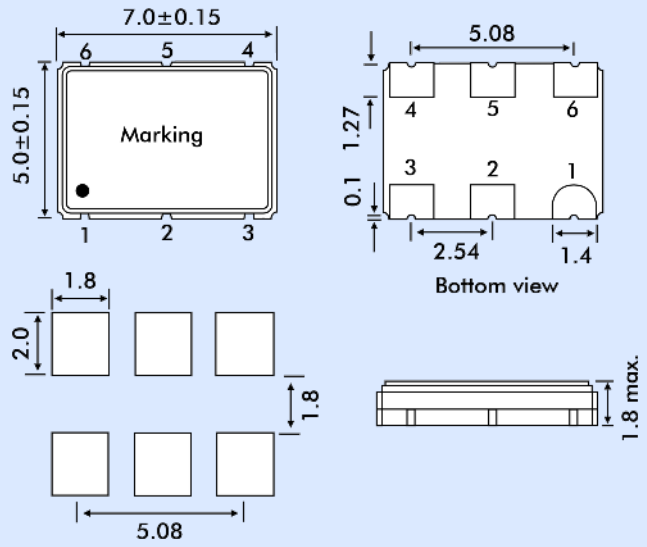
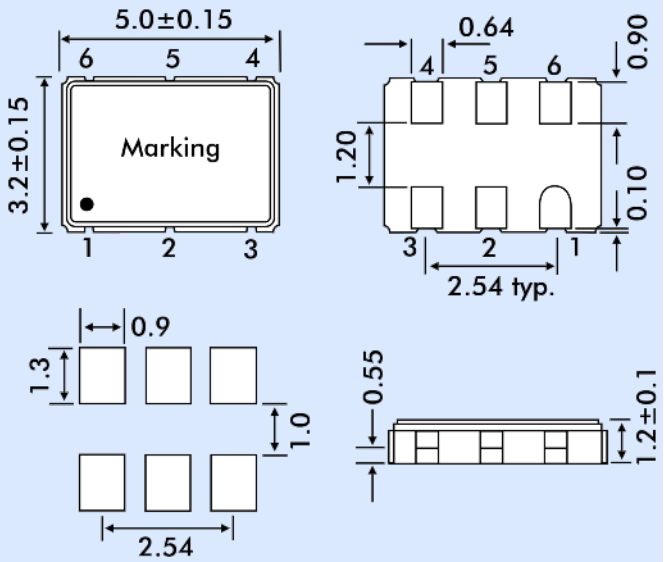
OUTLINE & DIMENSIONS

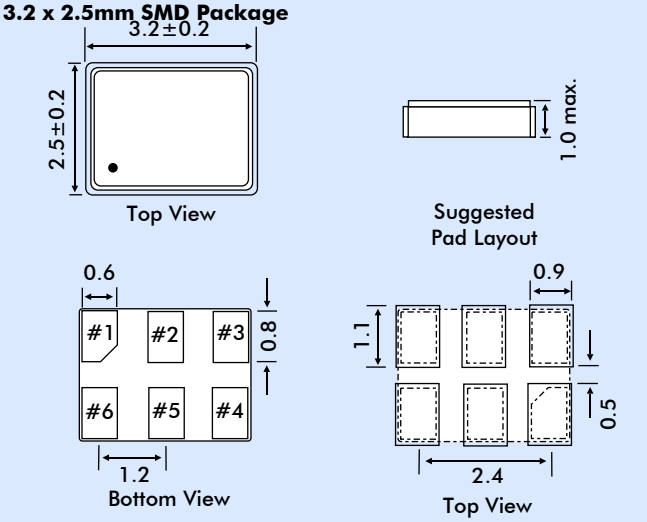
7.0 x 5.0mm SMD Package



5.0 x 3.2mm SMD Package



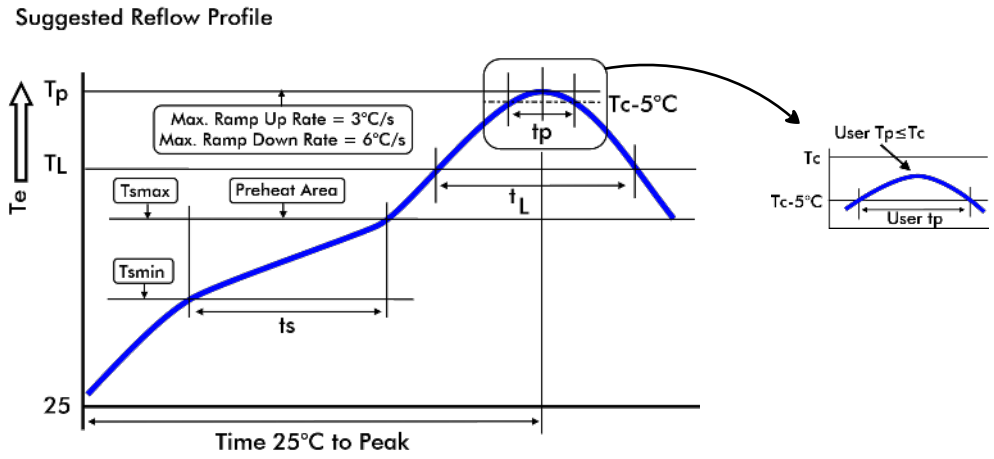
3.2 x 2.5mm SMD Package



ENVIRONMENTAL PERFORMANCE SPECIFICATION

Environmental Approvals	RoHS Compliant, Pb (lead) free in accordance with EU Directive 2002/95/EC 6/6 (2002/95EC) and WEEE (2002/96/EC). Free of halide, cadmium, hexavalent chromium, lead, mercury, PBBs and PBDEs
Moisture sensitivity Level	Level 1 (infinite) according to IPC/JEDEC J-STF-020D.1
Second Level Interconnect	'e4
Storage Temperature Range	-55° to +125°C
Humidity	85%RH, 85°C, 48 hours
Fine Leak / Gross Leak	MIL-STD-202F Method 1014, Cond. A / MIL-STD-883, Method 1014, Cond C.
Solderability	MIL-STD-202F method 208E
Reflow	260°C for 10s. 2 times
Vibration	MIL-STD-202F Method 204, 35g, 50 to 2000Hz
Shock	MIL-STD-202F, Method 213B, Test Cond. E, 1000gg 1/2 sine wave.
Resistance to Solvents	MIL-STD-202, Method 215
Temperature Cycling	MIL-STD-883, Method 1010
ESD Rating	Human Body Model (HBM): 1500 V minimum.
Pad Surface Finish	Gold (Au)(0.3µm ot 1.0µm) over nickel (Ni)(1.27µm to 8.89µm)
Weight of the Device	576 package: 0.18gm typical, 536 package: 0.09gm typical.

RECOMMENDED SOLDER TEMPERATURE PROFILE



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak		
- Temperature min. (Ts min.)	100°C	150°C
- Temperature max. (Ts max.)	150°C	200°
- Time (ts) (Ts min. to Ts max.)	60 to 120 seconds	60 to 180 seconds
Ramp-up Rate (T_L to Tp)	3°C/second max.	3°C/second max.
Luiquidous temperature (T_L)	183°C	217°C
Time (tL) maintained above T_L	60 to 150 seconds	60 to 150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time (Tp) within 5°C of the classification temperature Tc	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (Tp to T_L)	6°C/second max.	6°C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.

TEST CIRCUIT